



White-nose Syndrome

Frequently Asked Questions and Answers

Fall 2010

What is White-Nose Syndrome?

White-nose Syndrome (WNS) is a fungal disease that has killed more than one million bats across the northeast and mid-Atlantic United States during the past four years and continues unchecked. Bats with WNS may exhibit a white fungus that is found around the muzzle, ears, or wings of affected individuals. Other symptoms are displayed. For example, bats have been found moving to the entrance of the caves and often coming out of the caves and flying around in the middle of the day during winter months. Bats displaying this abnormal behavior have reduced fat reserves. Although it is normal for bats to occasionally interrupt their winter roosting, they are not equipped to withstand the drain on their fat reserves resulting from flying more often and during the day, a behavior thought to be caused by the irritation of the fungus. Many bats are non-responsive and many have been found dead both inside and outside caves.

What causes the bats to die?

Bats affected by WNS are basically starving to death, but scientists don't know what is triggering the starvation. Studies are under way to determine if the bats are going into hibernation underweight or if they lose their body fat at an accelerated rate during hibernation. If bats lose more body fat than normal during hibernation, they do not have the energy reserves to survive until spring. If they are going into hibernation underweight, scientists will explore the possible reasons for this.

Where has WNS been detected?

WNS has been detected in fourteen states: New Hampshire, Vermont, New York, Massachusetts, Connecticut, New Jersey, Pennsylvania, Delaware, Maryland, West Virginia, Virginia, Tennessee, Missouri, and Oklahoma, and in the Canadian provinces of Quebec and Ontario. *Geomyces destructans*, the fungus associated with WNS, has been detected on bats in several European countries including Spain, France, the Netherlands, Switzerland, Romania, and Hungary. European bats are not dying from WNS.

Why are you concerned about WNS spreading west?

The most recent discovery in Oklahoma represents the first confirmation of WNS west of the Mississippi River, and in a species of bat—cave myotis—not previously known to have been susceptible to WNS. The cave myotis is known to co-mingle in caves with a highly mobile bat species, the Brazilian free-tailed bat. These factors have heightened concern about the spread of WNS to the western United States, and to additional species and populations of bats across the continent.

Why are you considering closures to caves and mines?

Cave and mine access restrictions are being considered to slow the spread of WNS and reduce disturbance to bats while researchers continue to look for solutions to the devastating effects of

WNS on regional bat populations, and associated ecological and economic impacts. WNS is a disease that is thought to have killed more than one million bats during the last four years. In 2009, this disease spread south from New England into West Virginia and Virginia, a jump of nearly 500 miles. During the winter of 2009 – 2010, WNS continued to spread to Maryland, Delaware, Tennessee, Missouri, Oklahoma, Ontario, and Quebec, as well as additional sites in previously affected states. Transmission of WNS in previously affected states is probably caused by bat-to-bat transmission. **Evidence suggests that long-distance dispersal of WNS is likely the result of a human vector. WNS is now found as far west as western Oklahoma—about three hundred miles from the Pike-San Isabel National Forest.**

The fungus associated with WNS is new to science, and may possibly be an invasive species. The best available science shows that this fungus thrives in the cold and humid conditions common to caves and mines. While WNS is transmitted through bat-to-bat interaction inside caves and mines, evidence suggests the fungus can be transported inadvertently from site to site on footwear, clothing, and gear of cave visitors.

What proof do you have that people are contributing to the spread of WNS?

The mechanism of transmission is still unknown. The rapid dispersal of WNS from a single New York cave in 2006 to numerous sites in contiguous states and Canadian provinces by 2008 suggests that it is likely spread through direct bat-to-bat and bat-to-cave contact.

However, evidence collected to date indicates that human activity in caves and mines may be assisting the spread of WNS, even during seasons when bats are not occupying caves. This fungus likely can be transported inadvertently from site to site on footwear, clothing, and gear of cave visitors. The fungus can grow on many different organic materials, and appears to persist in caves and mines year-round. Fungal spores and/or other microscopic organisms can easily become attached to skin, hair, clothing, and equipment, and it is possible that spores could remain viable for weeks or months after leaving a subterranean environment.

The discontinuous nature of the rapid spread of WNS—especially to sites in West Virginia, Virginia, west Tennessee, Missouri, and western Oklahoma—suggests that a mode other than bat-to-bat transmission is contributing to the spread. The potential for the human-assisted spread of WNS is further supported by the fact that many of the recently affected sites are also popular destinations for recreational cavers; while many bat hibernacula (caves and mines where bats hibernate) in less-popular or inaccessible caves remain unaffected. Records of caver movements also reveal a connection between sites in these affected regions, additionally suggestive of a link to human activity.

If bats transmit disease, why are you restricting human access to caves and mines?

Bat-to-bat is likely the primary means of transmission of WNS, but strong circumstantial evidence suggests that humans have contributed to its spread in the eastern United States. Regardless of how it is transmitted to a location, evidence shows it spreads rapidly in the area and results in high mortality rates in regional bat populations. Confirmation of WNS in Missouri and northwestern Oklahoma has led us to conclude that there is an unacceptably high risk of continued spread west. This closure order responds to that risk. A one-year closure will give us time to assess the situation and incorporate new information into future management decisions.

What does the U.S. Fish and Wildlife Service advise?

The U. S. Fish and Wildlife Service issued a cave advisory on March 26, 2009:

1. *A voluntary moratorium, effective immediately, on all caving activity in states known to have hibernacula affected by White-Nose Syndrome, and all adjoining states, unless conducted as part of an agency-sanctioned research or monitoring project.*

Caves infected with WNS fungus may not show any obvious signs of its presence, and the actual geographic distribution of all affected sites is not known. Human activity in affected caves may cause fungal spores and particles to become airborne, thereby contaminating exposed materials and allowing for transport.

2. *Cavers in regions outside the White-Nose Syndrome -affected and adjacent states should be using clothing and gear that has never been used in caves or mines in the affected or adjacent states, and should thoroughly clean and contain all clothing and gear upon exiting those locations.*

Because there is a lag time between the initial point of contact with the fungus and the first visible evidence of its presence, we cannot be certain that apparently unaffected sites do not pose a risk for contamination. In order to minimize the risk that WNS could travel across state, regional or national boundaries on clothing and equipment, the U.S. Fish and Wildlife advises that clothing and equipment used outside of the affected region be decontaminated following the protocols available on the U.S. Fish and Wildlife White-Nose Syndrome web site:

<http://www.fws.gov/whitenosesyndrome/>

Does WNS pose a risk to human health?

WNS is in caves and mines that have been visited by hundreds of people during the past three years, yet there have been no reported illnesses attributable to it. However, because scientists are still learning about WNS, we do not know if there is a risk to humans from contact with affected bats, and we cannot advise you about human health risk.

Why care about bats?

Bats are an important part of our natural system. There are over 1,000 species of bats worldwide and they make up about a quarter of all mammal species. Bat populations all over the world are declining for various reasons.

Bats are important plant pollinators and they help control nocturnal insects, some of which are agricultural pests or vectors for human disease. Almost any insect that is active at night can be food for a bat, including moths, beetles, flies, crickets, gnats, mayflies, wasps, and mosquitoes. An individual bat can eat its body weight or more in insects every night. It is estimated that the one million bats killed by WNS to date would have eaten more than 5.5 tons of insects per night or 2.4 million pounds of insects per year. Bats are an important element in the ecology of caves. Many forms of cave life depend upon the nutrients brought in by bats and released from their guano (feces).

What bat species are susceptible to the disease?

Bats that hibernate in caves or mines where cool, moist conditions are favorable to the *Geomyces destructans* fungus are susceptible. To date, WNS has affected little brown, big brown, eastern

small-footed, northern long-eared, tricolor (formerly eastern pipistrelle), and cave bats, as well as the endangered Indiana and gray bats. Bureau of the Land Management supports about 16 – 18 species of bats in Colorado.

What do we know about bat species in BLM Colorado?

In general, bats are very guarded. Thus we have limited knowledge of where bats roost in Colorado. Roosts in caves and mines with moist, cool conditions are of highest risk for WNS.

The BLM Colorado Abandoned Mine Lands (AML) database has about 3,200 recorded sites. These sites are estimated to have more than 5,000 features such as adits, shafts, prospects, etc. Typically, BLM Colorado does not inventory mines for bats unless we plan to complete a mine closure for public safety. Most of the bat data collected for BLM Colorado was provided through the Colorado Department of Wildlife, and was for openings that are now closed or bat gated.

BLM Colorado also has an estimated 20 caves and is still in the process of surveying those caves. We currently don't have information on which of these caves serve as roosting and/or habitats for bats.

Where can I find out more about WNS and bats?

- The **U. S. Fish and Wildlife Service** maintains a web site with the latest information about WNS, including a list of all cave and mine closures across the United States:
- <http://www.fws.gov/WhiteNoseSyndrome/>
- **USGS Fort Collins Science Center WNS site:** <http://www.fort.usgs.gov/WNS/>
- The **National Speleological Society** maintains a web site that contains media stories about WNS, cave/mine closures, and the U.S. Fish and Wildlife Service's decontamination protocol: <http://www.caves.org/> .
- **Bat Conservation International, Inc.** provides an array of educational information about bats on its web site: <http://www.batcon.org/> .
- The **U. S. Geological Survey** has a web site that details why WNS is a concern to bat diversity, including endangered bats: <http://www.fort.usgs.gov/WNS/>
- The **National Wildlife Health Center's** web site offers information related to the fungal pathogen tied to WNS: http://www.nwhc.usgs.gov/disease_information/white-nose_syndrome/index.jsp
- **Rocky Mountain Region of the U.S. Forest Service:** <http://www.fs.fed.us/r2/>
- **Western Bat Working Group:**
<http://www.wbwg.org/conservation/whitenosesyndrome/whitenose.html>
- **Colorado Natural Heritage Program:**
http://www.cnhp.colostate.edu/RASwebpage/cbwg_website/ColoradoBatConservationPlanFebruary2004.pdf